

Claims

- [1] 1. Sustained-release preparations characterized by being prepared from double granules which are obtained by primary granulation of drug according to melt granulation using hydrophobic release-delaying additives, and then by secondary granulation of the obtained granules according to wet granulation using hydrophobic wet-granulation material.
- [2] 2. The sustained-release preparations in Claim 1, characterized in containing 0.5 to 80% by weight of drug, 10 to 65% by weight of hydrophobic release-delaying additive, and 1 to 35% by weight of hydrophobic wet-granulation material.
- [3] 3. The sustained-release preparations in Claim 1 or 2, characterized in that said drug is tramadol, morphine, hydromorphone, oxycodone, diamorphone, alfentanil, allylprodine, alphaprodine, anileridine, benzylmorphine, benztiramide, buprenorphine, butorphanol, clonitazine, codeine, cyclazocin, desmorphine, dextromoramide, dezocine, dihydrocodeine, dihydromorphine, dimenoxadol, dimepheptanol, dimethylthiabutene, dioxaphetyl butyrate, dipipanone, eptazocine, ethoheptazine, levorphanol, methadone, meperidine, heroine or pharmaceutically acceptable salts thereof.
- [4] 4. The sustained-release preparations in Claim 1 or 2, characterized in that said hydrophobic release-delaying additive is one or more ingredients selected from a group consisting of natural or synthetic waxes, fatty acids, fatty alcohols, fatty acid esters, fatty acid glycerides including mono-, di- and tri-glyceride, hydrocarbons, hydrogenated fats, hydrogenated castor oils and hydrogenated vegetable oils.
- [5] 5. The sustained-release preparations in Claim 4, characterized in that said fatty alcohols are one or more ingredients selected from a group consisting of cetostearyl alcohol, stearyl alcohol, myristyl alcohol and lauryl alcohol, and said fatty acid esters are one or more ingredients selected from a group consisting of glyceryl monostearate, glycerol monooleate, acetylated monoglyceride, tristearin, tripalmitin, cetyl ester wax, glyceryl palmitostearate and glyceryl behenate, and said waxes are one or more ingredients selected from a group consisting of beeswax, carnauba wax, glyco wax and castor wax.
- [6] 6. The sustained-release preparations in Claim 1 or 2, characterized in that said hydrophobic wet-granulating materials are one or more ingredients selected from a group consisting of fatty alcohols, fatty acids, fatty acid esters, fatty acid

glycerides, hydrocarbons, waxes, hydrogenated fats, hydrogenated castor oils, hydrogenated vegetable oils, alkyl cellulose and acrylic polymer.

- [7] 7. The sustained-release preparations in Claim 1 or 2, characterized in further comprising pharmaceutical additives such as diluents, binders and lubricants.
- [8] 8. The sustained-release preparations in Claim 1 or 2, characterized in further containing a coating layer including coating agent.
- [9] 9. The sustained-release preparations in Claim 8, characterized in that the coating layer further comprise release-controlling materials, said material is at least one selected from a group consisting of sugars, inorganic salts, organic salts, alkyl-cellulose, hydroxyalkylcellulose, hydroxypropylalkylcellulose, polyvinylpyrrolidone, polyvinylalcohol and drugs .
- [10] 10. The sustained-release preparations in Claim 8, characterized in that said coating layer contains drug of 1 to 50% to total drug content of the preparation.
- [11] 11. The sustained-release preparations in Claim 8, characterized in that said coating agent is one or more component selected from a group consisting of ethylcellulose, shellac, ammonio methacrylate copolymer, polyvinylacetate, polyvinylpyrrolidone, polyvinylalcohol, hydroxymethylcellulose, hydroxyethyl-cellulose, hydroxypropylcellulose, hydroxybutylcellulose, hydroxypentyl-cellulose, hydroxypropylmethylcellulose, hydroxypropylbutylcellulose and hydroxypropylpentylcellulose.
- [12] 12. A method for preparing the sustained-release preparations of Claim 1, comprising (1) a drug is mixed with hydrophobic release-delaying additives and subjected to melt granulation thereby to prepare primary granules, and (2) thus obtained granules are mixed with hydrophobic wet-granulating material and subjected to wet granulation thereby to prepare secondary granules.
- [13] 13. The method in Claim 12, characterized in further comprising a step of coating said secondary granules or its compressed-granules into tablet with coating solution comprising coating agent.